GOVERNMENT OF INDIA
MINISTRY OF TOURISM & CIVIL AVIATION
(COMMISSION OF RAILWAY SAFETY)

RAILWAY ACCIDENT INVESTIGATION
REPORT
on

FOLLOW-ON COLLISION

between

316 Down Chakradharpur-Adra-Howrah Passenger

and

324 Down Rourkela-Howrah Express train

at

PANSKURA STATION,
South Eastern Railway,

on

December, 197.

CORRIGENDUM

Page No.	Para No.	Line No.	For	Read
5	16(c)	1	Add 'and' between 'fittings' and 'in'	
5	12	8	neede	needed
15	59	7	pratice	practice
	-	-	At the left bottom corner add 'Calcutta, dated 17.1.72.'	
17	-	1	Annexure II	Annexure I
23	-	6 (from bottom)	have been	have seen

सत्यमेव जयते

SUMMARY

1. Date	5th December 1971
2. Time	3.12 Hrs
3. Railway	South Eastern.
4. Gauge	Broad 1.676 meters (5'-6")
5. Location	Panskura Station (Km.70.455 from Howrah).
6. Nature of accident	Follow-on collision.
7. Trains involved	(i) 316 Down Chakradharpur-Adra-Howrah Passenger (ii) 324 Down Rourkela-Howrah Express.
8. Consisting of	(i) 13 coaches. (ii) 15 coaches.
9. Engine No.	(i) 20721-WAG-1 (ii) 20204-WAM-1.
10. Estimated speed	(i) 30 Km P. H. (ii) 95 Km P. H.
11. System of Operation	Automatic Block System.
12. Number of Tracks	Three line.
13. Gradient	Level.
14. Alignment	Straight
15. Weather	Clear.
16. Visibility	Good
17. Casualties	Killed-2 Injured-Grievous:1 Simple :3
18. Cause	No.324 Down having passed the Down Main Home Signal of Panskura in the 'ON' position
19. Persons held responsible	Driver of No. 324 Down Assistant Driver of No. 324 Down

सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF TOURISM & CIVIL AVIATION
(COMMISSION OF RAILWAY SAFETY)

From

The Additional Commissioner of Railway Safety,
South Eastern Circle,
14, Strand Road, 12th floor, Calcutta-1.

To

The Secretary to the Government of India,
Ministry of Tourism & Civil Aviation,
New Delhi.

Through : The Commissioner of Railway Safety,
Lucknow.

Sir,

In accordance with Rule 10 of the Railway Board's Notification No. 59-TTV/42/1 dated 11th April 1966, I have the honour to submit the Report on my Inquiry into the follow on Collision between 316 Down Chakradharpur-Adra-Howrah Pass. train and 324 Down Rourkela-Howrah Express train at Panskura station of South Eastern Railway at 03.12 hrs. on 5-12-1971.

The Accident

2. (a) No. 316 Down Chakradharpur-Adra-Howrah Passenger train was received on the Down Main line of Panskura station at 3.05 hrs. on 5-12-71 and left at 3.10 hrs. for Bhogpur on proper signals. After starting from the station, as its train engine was passing the east cabin and the rear portion was near the front end of the platform, No. 324 Down Rourkela-Howrah Express having disregarded the Home signal at danger, came and collided into it at a high speed from the rear.

(b) As a result of the accident, the rear most coach of 316 Down, i.e. RA-8 (Inspection Carriage), was smashed, its underframe having ridden on the top of the front portion of 324 Down loco and the trollies lying underneath, damaged. The next coach No. FCT 893 which was the slip coach from Bankura, marshalled in front of RA-8, had derailed and capsized on the right side. Both its trollies had sheared off. LVPR No. 2865 in front of the Bankura coach had its rear buffers damaged. There was no damage to the rest of the train except that the train engine and the first coach had parted from each other and also from the rest of the train.

(c) Further, the front cab of the train engine No. 20204 WAM-1 of 324 Down was smashed and the engine had derailed of all the wheels. The first two coaches of the train viz. LVPR No. 2864 and GT No. 5048 were also derailed of all wheels while the third coach viz. GTY 1836 had derailed of the front trolley.

(d) All the running lines were blocked by the damaged OHE mast and the hanging catenary.

Casualties

3. The Driver of 324 Down was killed at the spot while another railway Khalasi travelling in RA-8 was seriously injured and died a little later. In addition, 4 persons received injuries, the injuries of one of them being grievous. 14 others had only trivial injuries. Of them, 10 were allowed to proceed on their journey after getting first-aid while 4 were brought to Kharagpur Railway Hospital for observation and were discharged from there, later.

The Inspection & Inquiry

4. (a) The intimation of the accident was received by me at about 5.00 hrs. at Kharagpur, while travelling by 4 Down Mail and I, along with Transportation Superintendent (Safety), and Deputy Chief Mechanical Engineer (Carriage & Wagon) left by road reaching the site of accident at 7.30 hrs. when the inspection of the damaged locomotive, the rolling stock and other relevant features was carried out.

(b) The two injured persons in the South Eastern Railway Hospital at Kharagpur were visited on the 10th to satisfy myself that they were being looked after properly.

5. (a) The inquiry was conducted at Panskura station at 10.00 hrs. on 9th December 1971 and it was continued on the next day at Kharagpur. The following officers were present at the inquiry :—

1. Shri K. N. Nair, Transportation Superintendent (Safety).
2. „ P. Krishnamurthy, Dy. Chief Mechanical Engineer (Carriage & Wagon).
3. „ S. Panchapagesan, Engineer-in-Chief (Signal & Telecommunication).
4. „ A. J. Gurushakar, Dy. Chief Electrical Engineer (Traction).
5. „ S. Krishnan, Divisional Superintendent, Kharagpur.

Other Divisional Officers were called in as and when required.

(b) The District Magistrate and the Police authorities were duly advised of the date, time and place of the inquiry. Shri Satish Chandra Chowdhury, Inspector, Railway Police, Kharagpur was present throughout.

(c) A press notification was issued on 6-12-71 informing the public having information bearing on the accident to appear at the inquiry at Panskura on the 9th or to correspond with me at my Calcutta address.

(d) Evidence and statements of 29 witnesses were recorded.

NOTE: 1. The terms 'Right' and 'Left', 'Front' and 'Rear' etc. where used in this report are in the direction of travel'

2. The kilometerage of the various places mentioned in the report as reckoned from Howrah station is given below:—

	Kms.	
Howrah	0.00	
Bhogpur	64.00	
Site of accident	70.455	
Panskura	70.8	
Khirai	76.4	
Haur	80.5	
Kharagpur	115.5	
Midnapore	128.3	On Kharagpur-Adra Section
Bankura	230.3	
Adra	283.6	
Chakradharpur	311.8	
Manoharpur	372.9	
Rourkela	412.8	

The Trains

6. No. 316 Down Chakradharpur-Adra-Howrah Passenger was hauled by Electric locomotive No. 20721 WAG-1 and consisted of 13 vehicles. The length and weight of the train inclusive of engine were 298 metres (977') and 643 tonnes respectively.

No. 324 Down Rourkela-Howrah Express was hauled by Electric Locomotive No. 20204 WAM-1 and consisted of 15 vehicles. The length and weight of the train inclusive of the engine was 349 metres (1145′) and 732 tonnes respectively.

7. Both the trains were fully vacuum braked, 316 Down Passenger having 100% and 324 Down Express having 96% effective pistons. The engines of both the trains were fitted with electric head lights as well as speedometers in working order. While 324 Down had a TELOC chart fitted, there was no chart on 316 Down.

8. The two trains were marshalled as follows :—

No. 316 Down.

Engine No. 20721 WAG-1.

1.	Coach	No. TLR 2701	—Third Luggage & Brake	(ICF)	Steel body
2.	,,	No. GT 5143	—Third Class	,,	,, ,,
3.	,,	No. FC 338	—First Class	(IRS)	Wooden body with metal panelling
4.	,,	No. SY 996	—Second Class with ladies compartment	,,	,,
5.	,,	No. WGTCNY 5864	—Third Class 3-tier sleeper with ladies compartment	(BEML)	Steel body
6.	,,	No. TPPT 2797	—Third, ¾ postal unit	,,	,,
7.	,,	No. GT 1878	—Third Class	(IRS)	Wooden body with metal panelling
8.	,,	No. GTY 1785	—Third Class with ladies	,,	
9.	,,	No. GT 1176	—Third Class	(BEML)	Steel body
10.	,,	No. GTY 1973	—Third Class with ladies	(ICF)	,,
11.	,,	No. LVPR 2865	—Luggage, parcel & brake	(IRS)	Wooden body with metal panelling
12.	,,	No. FCT 893	—First Class & Third Class	(ICF)	Steel body
13.	,,	No. RA 8	—Inspection Carriage	(IRS)	Wooden body with metal panelling

सत्यमेव जयते

No. 324 Down.

Engine No. 20204 WAM-1.

1.	Coach	No. LVPR 2864	—Luggage, Parcel & Brake	(IRS)	Wooden body with metal panelling
2.	,,	No. GT 5048	—Third class	(BEML)	Steel body
3.	,,	No. GTY 1836	—Third Class with ladies	(IRS)	Wooden body with metal panelling
4.	,,	No. FC 479	—First Class	(ICF)	Steel body
5.	,,	No. WAC 660	—Air-conditioned	(IRS)	Wooden body with metal panelling
6.	,,	No. SY 992	—Second Class with ladies compartment	(IRS)	-do-
7.	,,	No. WGTCNY5857	—Third class 3-tier sleeper with ladies compartment	(BEML)	Steel body
8.	,,	No. GTCG 2314	—3-tier sleeper-cum-sitting	,,	,, ,,
9.	,,	No. WTYLR 6193	—Third with ladies compartment, luggage and brake	(ICF)	,, ,,
10.	,,	No. GTCWY 2377	—Third Class 2-tier sleeper with ladies compartment	(BEML)	,, ,,
11.	,,	No. TPPT 2776	—Third, ¾ Postal unit	,,	,, ,,

12.	Coach	No.	FCT	876	—First Class & Third Class	(ICF)	Steel body	
13.	,,	No.	GTCYN	6623	—Third Class 3-tier sleeper with ladies compartment	,,	,,	,,
14.	,,	No.	FC	500	—First Class with coupe	,,	,,	,,
15.	,,	No.	TLR	2996	—Third, Luggage & brake	[BEML]	,,	,,

NOTE: 1. All the coaches belonged to South Eastern Railway except Coach Nos. 9 and 13 on 324 Down, which were of Central Railway.

2. Prefix G denotes coaches with self generating equipment.

3. Prefix W denotes coaches with vestibule arrangement.

Passenger Occupation

9. The total seating capacity of 316 Down was 819. The occupation was, however, not heavy and the train was estimated to have carried about 35% passengers at the time of the accident. 324 Down carried 663 passengers against the occupation capacity of 811 as follows:—

Cl	Accommodation	Occupation
ACC	14	14
First	78	46
Second	72	30
Third	647	573
Total	811	663

सत्यमेव जयते

Damage

10. (a) **Rolling Stock.**

No. 316 Down.

(i) RA-8 (rearmost coach)—The body was smashed; the underframe was twisted badly and one end was interlocked with the electric loco of 324 Down near the wind-screen, while the other end was free and resting on the ground. Both the trollies had run out, one having got under the cow-catcher of the engine of 324 Down and the other was lying under the frame in a damaged condition.

(ii) FCT 893 (2nd coach from the rear) had capsized and was resting on its right side. Entire right side panelling was damaged; both the trollies had sheared off from the underframe and got interlocked with the underframe of RA-8. The front end of the coach, having hit the electric mast, had been pushed in.

(iii) LVPR 2865 (3rd coach from rear)—One buffer at the rear end was damaged; in addition, there was slight damage to the end pillar of the body.

No. 324 Down.

The locomotive—The front cab was badly damaged including the instrument panel and the driving equipment. The speedometer was broken and the reverser handles damaged. All pipe line connections and the jumper cable connections in the cab were damaged and smashed beyond repairs. The wind-shield on the rear end had cracked. There was no damage to any of the coaches.

(b) **Signalling**—One signal post viz. Down starter No. 75/77 with the entire assembly was damaged and uprooted.

(c) **Permanent Way**—Six rail panels complete with wooden sleepers and fittings in addition 4 more rails and 10 wooden sleepers were damaged.

(d) **Traction Equipment**—OHE Portal No. 70/13-14 was smashed; Mast No. 70/16 knocked down; 5 span droppers damaged and the overlap provided at the east-end was broken.

11. The total estimated cost of damage as a result of the accident was Rs. 3,01,200.00 as under :—

(i)	Electric locomotive	Rs.	2,00,000.00	P
(ii)	Rolling Stock	Rs.	70,000.00	P
(iii)	Permanent way	Rs.	20,000.00	P
(iv)	Traction	Rs.	10,000.00	P
(v)	Signalling	Rs.	1,200.00	P
		Rs.	3,01,200.00	P

The Relief

12. The Assistant Station Master on duty at Panskura, on hearing the sound of the collision informed the section controller about it and also called the Railway Assistant Medical Officer (Construction) and the local Civil Doctor for assistance. The train staff and the station staff under the supervision of the A.M.O. (Construction) rendered first-aid to the injured. The Kharagpur Medical Relief Van was ordered at 3.35 hrs. and started at 4.10 hrs. accompanied by the Divisional Medical Officer with other doctors and medical staff as well as the Divisional Officers. The train arrived the site of accident at 5.45 hrs. whereafter the doctors and staff attended on the injured and made arrangements for the transport of those who needed hospitalisation, to Kharagpur by the medical van.

13. Arrangement for the transport of 60 Upper Class and 300 Third Class passengers of the two trains, who desired to proceed to Howrah by road, was made by the Railway in six buses and two taxis. Light refreshment was served to the injured as well as the other stranded passengers.

सत्यमेव जयते

14. Ex-gratia payment was made by the railway to the injured and the relatives of the dead.

Restoration

15. (a) The Kharagpur Relief train with 75-ton steam crane was called out at 4.50 hrs. and arrived the site at 6.15 hrs. The 120-ton Diesel Crane was also ordered out and left Kharagpur at 10.45 hrs. and was detained en route to allow passage of the long distance Mail and Express trains, after which it was taken to the site at 16.00 hrs. to work and assist the Steam Crane for speeding up of the restoration.

(b) The train engine of 316 Down was pushed back with the help of a steam engine and attached to the parted coach and the rest of the train. After cutting away the entangled buffer at the rear end of the LVPR and detaching the front coupling with the capsized Bankura coach, the train was drawn ahead and worked to Howrah as 316 Down leaving Panskura at 10.10 hrs. A steam engine was used upto Bhogpur from where the original loco worked the train.

(c) The infringing portal was cut into pieces and thrown out. The Up Middle and Up Auto lines were cleared, the power supply to these lines was charged and these were restored to traffic at 10.40 hrs. The Down Auto line was restored between Haur and Panskura via the Down loop line at 13.45 hrs.

(d) After rerailing the derailed coaches and removing the electric engine with the help of the two cranes the Down Main line was restored at 3.45 hrs. on 7-12-71.

16. 7 long distance Down trains were affected and delayed for varying periods of upto about 7 hours while the local suburban trains were terminated short of their destinations.

II. LOCAL CONDITIONS.

17. The accident occurred at Km. 70.455 from Howrah on the east end (Howrah end) of Panskura station on the Howrah—Kharagpur electrified section of the South Eastern Railway. The probable point of collision was 91.42 meters in the rear of the Down Main Starter signal and 35.97 meters ahead of Panskura Down passenger platform.

18. The general direction of the line at Panskura is from east to west and the trains running from Kharagpur towards Howrah are designated as Down trains while those from Howrah to Kharagpur as Up trains. The terrain at the site of accident is flat cultivated country. The area falls in the Midnapore District of West Bengal and the Divisional Headquarters of the Railway are at Kharagpur.

19. A train approaching from Haur negotiates 2 small ½° reverse curves and runs eastwards for about 3 kilometers upto Khirai (Flag station) at Km. 75.896, from where it follows a 1° left handed curve and then runs south-east for about 2 kilometers crossing the Cossye river (7 × 100′ girder bridge). It then again runs eastward by a 1° right handed curve and negotiates 2 more 1° reverse curves before finally entering Panskura station.

20. The gradients between Haur and Khirai are on the level or upto 1 in 1000 rising. Beyond Khirai there is a rise of 1 in 250 for about 1½ kilometers upto the Cossye bridge which is on the level. After crossing the Cossye, there is a fall of 1 in 300 for nearly 3 kilometers right upto Panskura, where the track runs on the level and is then followed by a fall of 1 in 1700.

21. The track consists of 90 R 42′ long rails laid on N+6 wooden sleepers with 6″ to 8″ cushion of broken stone ballast.

Signalling

22. Multi-aspect Colour Light signals have been provided and there are 5 signals between Haur and Panskura, 4 automatic and 1 semi-automatic as follows :—

AS 92 . .	Km. 78/8-10	(automatic, three-aspect)
AS 90 .	Km. 77/2-4	(,, ,,)
AS 88 .	Km. 75/10	(,, ,,)
AS 86 .	Km. 73/6-8	(,, four-aspect)
Home Signals No. 3, 4, 5 & 6 of Panskura.	Km. 71/32	(Semi-automatic, four-aspect)

No. AS 86 and Panskura Home signal have been provided with 4-aspects to include the double yellow aspect which is provided when either a train has to negotiate a turn-out beyond the next signal or when the two signals in advance do not have full braking distance.

The Station and its Working

23. Panskura is a 'B' Class Station, interlocked to Standard-III situated between Bhogpur and Haur stations and is equipped with multi-aspect colour light signals. On the Kharagpur end there are 2 lines viz. the Up Main line and the Down Main line worked on the Automatic Block System between Haur and Panskura while at Howrah end there are 3 lines, the outermost lines being the Up and Down Main lines worked on the automatic block system and the middle line as the up middle line or the absolute block system, the preceding block section being Bhogpur.

24. Panskura is also a Junction station for Haldia branch line which is a single line section opened only for Goods traffic with the adjoining block station at Tamluk and the trains

over this line are worked on the absolute block system by means of Paper Line Clear obtained on the Electric Speaking Instruments provided in the office of the Station Master on duty.

25. There are 6 running lines comprising of 1 Common Loop, 2 Up Loops, 1 Down Loop and Up and Down Main lines. Working of signals and points and crossing in Panskura Yard is controlled by an 80 lever cabin at the west end and a 100 lever cabin on the east end. All the lines are track circuited and multi-aspect colour light signals have been provided.

26. During the peak periods when trains follow one another closely and when it is possible to pass them over the main line without changing the route, the Main Line Home and Starter signals can be made to function as automatic signals by operating the relevant king levers in the cabins. The automatic marker of these signals is then lit up and the trains are then run as per the provisions of the automatic block system. For the down trains, the semi-automatic signals are the Down Main Home signal No. 3 (West Cabin) and the Down Main Starter signal No. 87 (East Cabin).

Rules and Regulations :

27. Relevant rules for working for Automatic and Semi-automatic signals which were affected in this case have been reproduced in Annexure I.

Permissible speed :

28. The maximum permissible speed of the section is 110 Km. P.H. for the selected pair of trains viz. Bombay Mail No. 1 Down and 2 Up. The maximum speed for 316 Down hauled by No. WAG-1 locomotive was, however, 75 Km. P.H. and for 324 Down hauled by WAM-1 was 100 Km. P.H., the booked speed for these two trains being 68 Km. P.H. and 90 Km. P.H. respectively.

Weather and Visibility

29. It was a moon lit night and the weather was clear. The visibility under the engine headlights was good. The Signals were also brightly lit and visible from a long distance.

III. SUMMARY OF EVIDENCE.

30. **Shri Madhorao, Driver of 316 Dn.,** said that his train arrived Panskura at 03.3½ hrs. on the Down Main Line on signals. After the Starter was taken 'off', he started at 03.11 hrs. As his engine and two bogies had passed Panskura East Cabin he got a sudden jerk. He applied his emergency brake as well as the loco brakes and his train stopped. On looking back, he found that his engine had parted. Telling his assistant to remain in the cab, he went to find out what had happened. He found the first coach standing isolated, one mast length in the rear and the rest of the train another one mast length behind it. RA-8, the last vehicle, was completely smashed and the coach in its front was thrown off the track and was lying on its side. The OHE with the portal frame was also completely smashed. He mentioned that between Haur and Panskura the aspects of AS 92, 90 and 88 were green, while AS 86 and the Down Home Signal of Panskura were yellow. According to him, the visibility of the signals between Kharagpur and Panskura was good throughout and he did not come across any dim or poorly lighted signals. The speed of his train at the time of collision was about 30 Km. P.H. On being questioned, whether he had, on any occasion, come across signals which might have been cleared for him when there was a train ahead in the section, he replied in the negative. He had, however, experienced to find a red signal after passing the previous one at green. (This is possible, if after the Driver passes the signal at green, and immediately thereafter, some short circuiting takes place in the track circuit ahead of the next signal). He had not on any occasion seen a red signal ahead of the green signal simultaneously.

31. **Shri Basant Singh, Assistant Driver of 316 Down** more or less corroborated the statement of his Driver. In reply to questions, he confirmed that all the signals between Haur and

Panskura were brightly lit and the speed of the train at the time of collision was about 30 to 35 Km. P.H. According to him, both signals AS 86 and the Panskura Down Home signals were displaying yellow aspects simultaneously.

> [ENC (S&T) Shri Panchapagesan explained that AS 86 could show a yellow indication (the next restrictive aspect) even when the home signal was at yellow if the green bulb of AS 86 is fused. He added that in case the home signal is at yellow with route set for the loop, AS 86 will display a double yellow aspect. AS 86 can also show single yellow when the home is at yellow and the relay repeating the yellow aspect of the home signal at the location of AS 86 fails to pick up. In all these cases the failure will be on the safe side.]

32. **Shri P. K. Chakraborty, Guard 'B'** took charge of 316 Dn. when it arrived Kharagpur at 1.50 hrs. His train arrived Panskura at 3.02 hrs. on the Down Main line and left at 3.10 hrs. after an extra detention of 3 minutes for taking the starter signal to 'off'. As the last vehicle of his train viz. RA-8 was passing the starter signal, he got a heavy jerk and he fell down in his lobby. After another jerk, the train stopped just opposite the east cabin. He went to the rear and found RA-8 totally smashed, coach No. 893 FCT capsized and LVPR 2865 damaged in its rear portion. Engine of 324 Dn. was damaged in the front and two bogies in its rear had derailed of all wheels. He took out his first-aid box and rendered first-aid to some passengers with minor injuries. He found the Assistant Driver of 324 Down lying unconscious near the engine and with the assistance of some students travelling on his train, he took him to the station on a stretcher.

According to him, the accident took place at 3.12 Hrs. and as per his guess, the speed at that time was between 15 and 20 Km. P.H.

33. **Shri C. J. Naidu, Guard of 324 Down,** took over charge of the train at Chakradharpur. Before leaving Chakradharpur he met driver Shri N. G. Raghavan. He corrected his watch with him and gave him the load particulars of the train. The train passed through Haur at 3.06 Hrs. and between Haur and Panskura the train passed all the automatic signals at 'Off'. The train did not stop at the Home signal of Panskura and he noticed that it entered the Main line at a speed even though there was a stoppage at the station. He applied the vacuum while passing the Home signal. Immediately after that, he had two jerks and was tossed about in the lobby, sustaining slight injury on his face and elbow. He came out and went towards the front where he found that his train had dashed into the rear of 316 Down. He immediately informed the Controller and the Station Master on duty about the accident. He then, with his first-aid box, rendered first-aid to the passengers having minor injuries. He found the engine of his train badly damaged and the driver dead.

In reply to questions, he stated that while approaching Panskura station, when he was about 1½ bogies in rear of the Home signal, he peeped out and saw that the aspect of the signal was showing red and the 'A' marker was not lit, but by that time a part of the train had already passed that signal. The speed of his train at the time of the accident was about 90 to 100 Km. P.H. The gauge was reading 44 cms. before he started applying the vacuum which he applied gradually and it dropped to zero only at the time of collision. He did not take notice of the cabinman exchanging signals as he was then busy applying vacuum. He knew Driver Raghavan for about a year and a half and found him hale and hearty. He was in good spirits and jovial mood when he met him at Chakradharpur. As far as he knew, the driver was a teetotaller and of sobre habits. The witness was questioned whether the driver observed the 16 Km. P.H. speed restriction in Radhamohanpur yard and 75 Km. P.H. between Haur and Panskura and his reply was that the speed restriction through Radhamohanpur yard was observed and 4 mts. were booked therefor. The other restriction of 75 Km. P.H. between Haur and Panskura, however, was not observed.

34. **Shri R. R. Sinha, Assistant Driver of 324 Down Rourkela-Howrah Express,** took over his duties at Rourkela with Driver Shri N. G. Raghavan. The journey from Rourkela to Kharagpur was uneventful and the train left Kharagpur right time. The speed restriction of 16 Km. P.H. was correctly observed by the driver through Radhamohanpur yard. The train passed on through signals at Haur. After passing Haur, the aspects of all automatic signals, viz. AS 92 AS 90, AS 88 and AS 86 were green. Panskura Home was observed to be at yellow. As the

train was passing Automatic signal AS 88, the driver asked him if he was feeling cold. He replied that he was not feeling so and it was much colder near Manoharpur. The driver, however, said that he was somehow feeling very cold and asked him to hand over his chaddar (sheet), which he did, after taking it out from his bag. The driver wrapped it round himself and took a little bit of 'khini' (i.e. tobacco) to which he was habituated and without which he never performed his duty. Thereafter, the Assistant Driver started observing the road and the signals. He shouted the aspects of Panskura Down Home signal as 'correct, yellow' and the driver responded to his words, saying 'yes, yellow'. While approaching the Home signal, he noticed that the driver was not controlling his speed inspite of the signal being at yellow and Panskura was a scheduled stop. He questioned the driver about it but got no response. So, he immediately applied the emergency brake and started tightening the hand brakes. As the train approached the level crossing, he observed the tail lamp of a train ahead and shouted to the driver to immediately apply the engine brakes. To this also, there was no response. He, however, continued to tighten the hand brakes. Shortly thereafter, his train collided with the one ahead and he fell inside the cab. After sometime, he regained his consciousness and found that his left leg was trapped among some wooden pieces, from which he could not extricate himself. He continued to lie there till he was rescued by some passengers and other staff.

According to him, all the signals between Haur and Panskura were brightly lit. He was questioned as to how could the Home signal of Panskura display a yellow aspect when 316 Down was still at Panskura within the Starter signal. He said, it should not have been so but he had experienced in the past that signals have behaved erratically and showed aspects which they should not. Sometimes a Home signal displayed green aspect and the Starter red and the station staff issued pilot memo saying that such aspect was due to electric fault. As an instance, he said that about 6 months earlier, he was working 83 Up with Driver Shri M. P. Thankey and the train was passing Bhogpur station when it was noticed that the Home and the Starter signals were both green but while the Starter turned to red, the Home continued to show the green aspect and the train was then piloted out. He also referred to another case of working 302 Down in April or May 1971 in which Uluberia Home signal was noticed to show green while the Starter was at red. But in that case the Starter was seen only after having passed the Home signal. Asked, if the driver having slept could have been the cause of his not controlling the train, he said that he was not a person to sleep on duty but it was possible that he had become unconscious. Regarding the driver's personal habits, he montioned that Driver Raghavan was a sobre person, cooked his own vegetarian meals and was a teetotaller. As far as he knew, he did not, at any time, take to drinking. He also did not talk of any problems or express any anxiety before taking up his duties at Rourkela or during the run. He did not complain of any headache or any other ailment either before or during his journey nor was he aware of his taking any medicines. About the brake power of his train, he said it was fully effective and the train could be controlled on all previous occasions without any difficulty. The speed was about 90 Km. P.H. near Panskura Down Home. He could not say about the speed at the time of collision.

35. **Shri T. N. Bhattacharjee, Assistant Station Master, Panskura,** was on duty from 2.00 hrs. to 10.00 hrs. on 5-12-71. 316 Down was admitted on Down Main line at 3.05 hrs. 16 packages were unloaded from the rear TLR and the Starter signal was lowered for its despatch. In the meanwhile, he received 'out report' of 324 Down from Haur. 316 Down left from platform No. 4 at 3.10 hrs. and he advised east and west cabins to admit 324 Down on the Down Main line after complete departure of 316 Down. As 316 Down was moving away, he noticed 324 Down entering the yard at a high speed although the reception signals for the same were at danger. He tried to attract the attention of the driver of 324 Down by showing red hand signal lamp (Danger Signal) from platform No. 1 which was closest to his office. The driver, however, did not control his train and dashed into the rear of 316 Down near about the Starter. He at once informed the Section Controller on duty Shri Bishnu of the accident, called for Station Master Shri P. K. Ghosh and informed Assistant Medical Officer, Construction, Panskura, Government Railway Police staff on the platform and Officer-in-Charge, Railway Protection Force, Panskura of the accident. The local civil doctor Shri Pashupati Maity was also sent for, for medical assistance.

Questioned, he said that Haur advised him about 'Train out of section' for 324 Down at 3.07 hrs. The running time between Haur and Panskura was 9 minutes. He was asked to explain how he had recorded his Private Number in the Train Register for the arrival of 316 Down at Bhogpur when it had not even left his station and he said that he had done so in anticipation though he had not actually exchanged the Private Number with the station in advance.

Regarding the stoppage of 316 Down at his station for 8 mts. instead of its scheduled stoppage of 5 mts., he said that he had no idea as these duties were performed by the Switchman.

36. **Shri K. P. Mahato, Switchman, Panskura West Cabin,** was on duty from 2.00 hrs. to 10.00 hrs. on 5-12-71. 316 Down passed his cabin at about 3.07 hrs. and was admitted on the Down main line after which he put back the Down Home signal and the lock bar levers to normal. He was informed by Assistant Station Master at about 3.09 hrs. that 324 Down had left Haur. After a few minutes he saw 324 Down entering at high speed without stopping at the Home signal which was at danger. He exhibited red hand signal lamp from the cabin to draw the attention of the driver but he did not take any notice and he informed the Assistant Station Master about this at once.

It was pointed out to him that, according to the Driver and the Guard of 316 Down, their train arrived Panskura at 3.03 hrs. and in the ASM's Train Register, the time was recorded as 3.05 hrs. while according to him, it was 3.07 hrs. He tried to explain this difference as being perhaps due to differences in the timings of different clocks. (It was observed that he did not follow a set sequence of recording various items in the Train Register in his different duties. He, however, could not explain his erratic behaviour in doing so.)

37. **Shri Rammohan Dey, Switchman, Panskura, East Cabin,** was on duty from 2.00 hrs. to 10.00 hrs. on 5-12-71. As per instructions of the Assistant Station Master, 316 Down was admitted on the Down Main line at 3.07 hrs. and then as per his (ASM's) orders, the Down Main line Starter was taken 'Off'. Shortly after his exchanging signal with the driver, when the engine and one bogie had passed beyond his cabin, he saw a headlight just in rear of the train and within a second he heard a very loud sound. Over the phone, the Switchman of the West Cabin told him that 324 Down entered the Down Main line without the Home signal having been taken off. He did not observe the time of collision but presumed that it was 3.11 hrs. There were a lot of discrepancies observed in the timings recorded by him and the West Cabinman. He was not able to explain them and finally admitted that his clock was not working properly and often it stopped. He had recorded the timings after inquiring from others and therefore, he was not sure of them.

38. **Shri L. P. Pendalwar, Assistant Signal & Telecommunication Engineer (Signal), Kharagpur,** was informed about the accident at about 3.40 hrs. on 5-12-71 by the Deputy Controller over the phone. He accompanied the Ambulance Special, arriving Panskura at about 05.37 hrs. While passing signal No. AS 86, he and the Divisional Safety Officer observed it at yellow and the Down Home signal at Red without the 'A' marker.

He found levers No. 36, 39, 41, 47, 52, 87* of the East Cabin in reverse position and other levers in normal position. Switchman on duty in East Cabin informed him that no slot was given for 324 Down and that starting signals were taken off for 316 Down from Down Main line. Levers No. 39, 47, 52 were pulled by the Switchman for admission of ambulance special and relief train. Levers No. 36, 41 and 87 were required for despatch of 316 Down from Down Main line.

*Note: These levers work as follows—
Lever No. 36 - Holding bar for Down Main line.
,, No. 39 - Lock bar for Up facing point.
,, No. 41 - Lock bar for Down facing point No. 40 - on Down Main line.
,, No. 47-Lock bar for Down facing point No.46
,, No. 52 - Lock bar for Up facing points No. 46 and 53.
,, No. 87 - Down Main line Starter to Main line.

While inspecting the site he found no points damaged and the route was correctly set and locked for despatch of 316 Down from Down Main line. Track circuit indications in East Cabin for tracks No. P5T, 40T, 28T and 53T were showing occupied.

In the West Cabin he found all the levers in normal position and all signals showing red.

He and the DSO jointly tested the Down Home signal of West Cabin and found that the signal could not be taken off for Down Main line as this line was occupied by 324 Down and the slot also could not be obtained.

He was questioned as to how Panskura Home signal as well as automatic signal AS/86 could both indicate yellow aspect at the same time and he explained that this was possible on account of cable theft. He, however, could not check on it that day as the Home signal was always at danger and AS/86 was thus, naturally showing yellow while its green aspect could only have been checked when the Down Home signal was taken off to yellow. The check of the relays also could not be made as the Relay Room remained locked and sealed the whole of that day. He had last inspected the cabin prior to the accident on 17-11-71.

39. **Shri N. K. Naskar, Block Signal Inspector, Kolaghat** on learning about the accident took the first available train upto Bhogpur and thereafter went by P.W.I's trolley reaching Panskura at 7.50 hrs. He went to the east cabin and found that the cabin door had been kept sealed while the levers had already been disturbed for shunting operation. He went to the west cabin in the afternoon to observe the functioning of the signals. He could not have access to the Relay Room to check the circuits inside as the cabin was kept sealed and, therefore, he proceeded to check the functioning of automatic signal AS 86 which he found displaying yellow aspect while the Home was at red all along, the track circuit ahead being occupied. He observed that when the train passed the automatic signal AS 86, its aspect changed to red but again went back to yellow after the train cleared the block overlap beyond the Home signal. When the derailed bogies had been cleared and the track relaid, the track circuits were resumed and tested for normal working at 2.00 hrs. on 6-12-71. The uprooted Up Starter signal was re-erected and started working at 16.00 hrs. At about 11 hrs., after restoring the Up Starter signal, he was informed of a cable theft and he replaced the cable at 15 hrs. when the west cabin seal was removed and everything found working all right except for a blown off fuse which was replaced.

In reply to a question as to how signal AS 86 and the Down Home signal simultaneously displayed yellow to the driver of 316 Down on 5-12-71, he said that this was possible if the cable leads repeating the yellow or green aspect of the Down Home signal were disconnected. He was further asked whether he checked for such a disconnection on 5-12-71 and he replied that he did not do so as there was no information with him that the automatic signal AS 86 does not go to green when the Home signal displays the yellow aspect. He was advised of the cable theft only at 11 hrs. on 6-12-71 and after he had replaced the stolen cable, signal working was checked and found alright.

Note: From the signal failure register it was seen that the Up Main Starter had failed at 22.25 hrs. on 4.12.71 in that the Up Main Starter was showing yellow indication even though AS 85 was green from which it could be concluded that the cable theft must have taken place at that time.

IV. OBSERVATIONS & TESTS.

Loco Controls

40. The driving controls of 324 Down loco (20204 WAM-I) were inspected by the Divisional Electrical Engineer (Traction Distribution), Kharagpur after the dead body of the Driver had been removed from the debris by gas cutting a number of parts which were obstructing its extrication. According to his observation, the driver's vacuum brake handle was in the lap position indicating that the emergency brake application had not actually been made but was to be operated next. The independent air brake handle was also in the unoperated position. These positions of the driver's vacuum brake and independent air brake handles were, however, seen by him when the control panel had been thrown out on the ground after being gas cut and may not, therefore, be indicating the position as it might have been at the time of accident.

41. The speed recorder had been damaged in the accident. A study of the speed recorder graph, however, showed that the recordings were not continuous and regular on account of the components of the recorders having become worn out, particularly the stylus and

the punching mechanism. This resulted in Time not having been recorded throughout its run. The speed also had been recorded only in portions. The recording graph paper had been torn and damaged during the accident but it could be seen that a speed of 95 Km. P.H. had been recorded just before the recording was discontinued. In view of this although the record can not be taken as absolutely authentic, it appears that the speed of the train at the time of the collision was 95 Km. P.H.

Braking Distance Trials

42. Emergency braking distance trials were carried out jointly by the Divisional Electrical Engineer (Traction Distribution) and the Divisional Mechanical Engineer (Carriage & Wagon), Kharagpur on 8-12-71. The empty rake involved in the accident of 324 Down, was utilised for this trial except that one of the coaches viz. WAC 660 was replaced by WAC 653 on account of the fact that WAC 660 had become unfit for run due to the bearing brass of an axle box having been stolen from the accident site and the journal getting scored. During the trial two tests were carried out with 96.6% brake power and average vacuum of 446 mm. The braking distance in these tests was observed to be 976.3 meters and 946.4 meters taking 58 seconds and 57 seconds respectively.

Signal Visibility

43. I checked the visibility of the various signals between Haur and Panskura while travelling by 84 Down on the morning of 11-12-71 and observed that all the signals were brightly lit up and were visible from a long distance. The actual visibility of the individual signals in each case was over one kilometer as follows :—

1. AS 92 at Km.78/8-10 was visible from Electric Mast No. 79/16
2. AS 90 at Km. 77/2-4 ,, ,, ,, 78/28
3. AS 88 at Km. 75/10 ,, ,, ,, 76/34
4. AS 86 at Km. 73/6-8 ,, ,, ,, 75/36
5. Down Home of Panskura at Km.71/32 ,, ,, ,, 73/22

V. DISCUSSIONS.

Time of Accident

44. According to the Driver and Assistant Driver of 316 Down the train started from Panskura at 03.11 hrs. and it must have been within a minute or two of the starting that the accident must have taken place. The Guard of 316 Down said that the train left at 3.10 hrs. and the accident took place at 3.12 hrs. The Assistant Station Master, Panskura also gave the time of the departure from his station as 3.10 hrs. There is however, some discrepancy in his time as regards the arrival of the train at his station which, according to him, was 3.05 hrs. while according to the Driver and the Guard it was 3.03 and 3.02 hrs respectively. It appears that the time recorded by the Assistant Station Master was to cover the lapse of the station staff in the delay to take off the signals. In any case, as it does not affect the time of departure of the train, which is accepted by everyone as 3.10 hrs. and the time of the accident is, therefore, to be 3.12 hrs.

The Speed of the two Trains

45. Driver of 316 Down said that his speed at the time of the accident was about 30 Km. P.H. The Assistant Driver estimated it to be between 30 and 35 Km. P.H. while the Guard put it as 15 to 20 Km. P.H. Driver's statement of 30 Km. P.H. is accepted as correct. In respect of 324 Down, the Guard of the train said that the speed of the train was between 90 and 100 Km. P.H. The Assistant Driver could not give the speed at collision but said that while the train was passing Panskura Down Home Signal, the speed was 90 Km. P.H. The station staff generally maintained that the train entered the station at a high speed. From this as well as the observation from the Speed Recorder Graph it could reasonably be concluded that 324 Down was running at about 95 Km. P.H. at the time of collision.

Brake Power of the train

46. There is no evidence to the effect that there was any defect in the available brake power of the train on account of which the Driver may have had difficulty in stopping train and the Assistant Driver has confirmed that the brake power of his train was fully effective and the train could be controlled on all previous occasions without any difficulty. From the braking distance trials also it has been established that the train could be stopped within a distance of 1 kilometre (the distance during the trials being 976.3 meters).

Aspects of Signals

47. The Assistant Driver of 324 Down deposed that signal No. AS 86 was showing green while the Panskura Home was at yellow. The Switchman of West Cabin, however, denied having cleared the Home signal and Switchman, East Cabin also denied to have given slot for that signal. The Assistant Driver as well as the Cabinman are both interested parties. The fact, however, that 316 Down had not cleared the track circuits of Panskura Down Home signal proves beyond doubt that the Home signal could not have been anything but at danger, unless there was either sabotage or some defect in the signalling system. As the Home Signal was, observed to display red aspect and AS 86, the yellow aspect after the accident, it is reasonable to conclude that there was no defect or interference in the Signalling. The Assistant Signal & Telecommunication Engineer, Kharagpur and the Block Signal Inspector, Kolaghat who tested the system afterwards also did not find anything wrong with it.

48. Moreover, the Driver of 316 Down observed that both Automatic signal AS 86, and the Down Main Home signal were simultaneously displaying the yellow aspect when he passed them. Normally such aspects should not be possible but it was found that there had been a cable theft between the Down Home signal and AS 86 which is confirmed from the Signal Failure Register where it has been recorded that at 22.25 hrs. on the night of 4-12-71, the Up Main Starter had failed in that this signal displayed yellow aspect even when AS 85 was green and the same cable carries the conductors controlling the various aspects of Signal AS 86 which are correlated with those of the Dn. Home Signal. From this it is clear that in the morning of 5-12-71 when 324 Dn. passed AS 86, it could not have shown the green aspect. I, therefore, can not accept the statement of Assistant Driver in this respect and feel certain that 324 Dn. passed the Automatic signal AS 86 at yellow and the Down Main Home signal at red and the accident was caused on this account.

Further, it has to be remembered that Panskura is a stopping station for 324 Down and even if the aspects of AS 86 and Down Main Home Signal were Green and Yellow respectively as alleged by Assistant Driver Misra, the train had to stop at the station and should, therefore, have entered at a much slower speed. It is, however, seen that the speed at collision was about 95 Km. P.H. and the probable point of collision only 91.42 m in rear of the Down Main Starter Signal, which undisputably displayed the danger aspect. In fact the train, after the collision went and stopped 29.4 metres ahead of the Starter Signal. This clearly shows that no attempts had been made to stop the train or reduce its speed before the collision took place and something was amiss with the train crew at that time.

Possible reasons for Driver's failure

49. All concerned witnesses during the inquiry were emphatic that Driver N. G. Raghavan was a very good Driver and was of sobre habits. His record all through has been clear and he was considered an efficient driver of the Railway. Assistant Driver R. R. Sinha refused to accept that the Driver could have slept and said that he was not a person to sleep on duty. The Guard C. J. Naidu had met him at Chakradharpur before starting and found him in good spirit and jovial mood. I am, therefore at a loss to understand the Driver's failure and I requested the Chief Medical Officer of the Railway to ensure that the post mortem examination of his body was carried out carefully to determine if there could have been a sudden heart failure resulting in his death before the accident. The post mortem examination, however, did not reveal any such thing and sudden death prior to the accident, is ruled out. From Assistant Driver, Sinha's statement it is, however, noted that as the train was passing Automatic Signal AS 88, the Driver had asked him if he was feeling cold and he had replied in the negative adding that, in fact it was much colder near Monoharpur. The Driver on that had said that somehow he was feeling very cold and asked the Assistant Driver to hand over a sheet to cover himself and he took the sheet out from

the bag and gave it to him. The Driver also took some tobacco to which he was habituated and without which he never performed his duty. Shortly after that, he passed the Automatic signal AS 86, at yellow and the Home signal at red. This evidence leads one to believe that there was something physically wrong with the driver at that time which made him suddenly feel cold. It is very difficult to establish now what it could be but there is a likelihood that this condition of his suddenly incapacitated him and his normal reactions were impaired, and prevented him from applying the brakes in time.

Assistant Driver's failure

50. When a driver of a train fails to apply the brakes while approaching a signal at danger the duty devolves on the Assistant Driver to do so. Assistant Driver, Sinha has not accepted that AS 86 was showing yellow and the Down Home signal was at red because if he did so he would be held responsible for not applying the brakes of the train in time. He stated that he was surprised why the Driver was not taking action to stop the train although Panskura was a scheduled stop and when he saw that he was not reducing his speed after passing the Home signal at yellow he applied the emergency brakes. I consider these statements to have been made only to save himself. It is also felt that he may not come out with the truth as that is likely to more seriously involve him in not taking action to stop the train. There is a possibility that when the Driver was feeling cold and he was busy handing over the sheet etc. and the Driver became incapacitated, he got busy in trying to attend on him rather than apply the emergency brakes. There is no other way in which a failure on the part of the Assistant Driver can be explained. He is also said to be one of the good and efficient employees of the Railway and has had no punishments during 8 years of his service. Whatever be the reasons, in any case the Assistant Driver failed to act in stopping the train while it passed the Down Main Home signal at danger and has thus contributed in having caused the accident. It has however, to be kept in view that it is quite natural for one's attention being diverted on such occasions, specially when one is not actively associated with the driving.

Unsafe failure of Signals

51. The Assistant Driver referred to some failures which he considered to be on the unsafe side and cited two instances in which he came across cases when a signal displayed red while the preceding signal was at green. In one of these cases, he saw the red aspect after he had passed the preceding signal while in the other he could see both these aspects simultaneously. Where the red aspect of the signal was seen only after passing the preceding signal, it was explained by the Railway that this was possible when some defect developed or track circuit ahead was wilfully shortened by miscreants after the preceding signal was passed. The signal aspect would then immediately turn to red and the preceding signal would also have turned to yellow had the train been in rear of that signal. The other case, however, where these conflicting aspects were seen simultaneously was investigated by the Railway Administration and from their report it is seen that there was no such case reported and Shri Sinha could not bring to their notice any specific instance of this type.

52. While investigating into another collision between 38 Down Madras—Howrah Janata Express and Empty rake of K. 101 Bauria—Kharagpur Local at Uluberia station on 27-11-1970, the Divisional Officers' Inquiry Committee came across two cases of automatic signals having failed on the unsafe side in a signal displaying 'clear' aspect while the section ahead was blocked. As a signal failure on the unsafe side is considered a very serious matter, the Railway was requested to investigate it in detail to find out why and how such a phenomenon had occurred and what precautions and remedial measures they proposed to take. An Administrative Officers' Committee was set up by the Railway for this investigation and the report of this Committee is enclosed as Annexure II. From this it is seen that the failure was attributed to an interference by Signal Staff against whom disciplinary proceedings are being instituted. The Committee also recommended that S&T Staff below the rank of Block Maintainer should not have independent access to the relay room. This recommendation has been accepted by the Administration and suitable instructions issued.

VI. CONCLUSIONS

Cause of the Accident

53. From all evidence available, and the inspections and observations at site, I have come to the conclusion that the collision between No. 316 Down Chakradharpur-Adra-Howrah Passenger and No. 324 Down Rourkela-Howrah Express at Panskura on 5-12-71, was caused by No. 324 Down having passed the Down Main Home signal of Panskura in the 'ON' position. The deceased Driver Late N. G. Raghavan is held responsible for having failed to stop the train at the signal displaying danger aspect. This, in all probability happended due to his suddenly having become physically incapacitated. No reason for this incapacitation could however be established.

54. Assistant Driver R. R. Sinha failed to apply the emergency brakes which he should have done according to Subsidiary Rule 122/1. Here, I may mention that as I have discussed in para 49 & 50 that there are clear indications of the Driver having become incapacitated, it is most likely that the Assistant Driver's attention was diverted and he got busy in trying to attend on him. In view of this, I would suggest a lenient view being taken for this lapse of his.

55. Driver N. G. Ragahavan was about 52 years old and was appointed in serivce on 25-1-1945. He was promoted as Driver Grade 'C' in October 1947 and has been working as 'A' Grade Driver from March 1963 and had therefore nearly nine years' experience in this grade. He had passed his last medical examination in February 1971 in A-1 category with two pairs of glasses for distant and near vision. His record of service has been very good throughout and he had no punishment recorded against him.

56. Assistant Driver Sinha is 27 years old and was appointed as A-Grade Fireman in October 1963. He was last medically examined in October 1969 and his record of serivce also is very good having had no punishments against him.

Relief Arrangements

57. I am satisfied that the medical relief to the injured was satisfactory and the other passengers were also looked after properly after the accident.

Remarks and Recommendations

58. It has been, in the past, recommended by the Commission of Railway Safety that all locomotives should be provided with 'driver's vigilance device' so that a train would automatically stop in case the driver either dosed off or became incapacitated on this account. The recommendation has been accepted in principle and in fact the Railway Board are conducting experiments to provide a suitable type of automatic train control so that the train would automatically come to a stop in case the driver failed to take action and stop his train when a signal was at danger. 240 sets of this device have been recently ordered for extended trials. It is strongly recommended that these trials should be actively pursued and finalised after which the provision of automatic train control on all trunk routes should receive the highest priority to eliminate the possibility of such accidents taking place.

59. It is strongly recommended that cases of failures of signals on the unsafe side should be promptly investigated in great detail to find out the cause therefor and take such action as is considered necessary for their elimination. Further, it should be checked that if electrical signalling equipment is being handled by staff below the rank of a Block/Electrical Signal Maintainer in contravention of Para 1415(b) of the Signal Engineering Manual and independent access to the Relay Rooms, apparatus cases etc. is being permitted to such staff, this pratice should immediately stop. It is, therefore, suggested that all Railways should be suitably instructed in this connection.

60. It was observed that the speed recorder on the locomotive of 324 Down was not functioning satisfactorily. It is, therefore, felt that there is a need for improvement in this direction and it is understood that the Railway is taking necessary steps in this connection.

Yours faithfully,

(Sd.) ARYA BHUSHAN

Additional Commissioner of Railway Safety,
South Eastern Circle.

Railway Board's remarks on paras. 58-60 of the report

1. **Para. 58 of the report:** Trials with 240 sets of an indigenous drivers vigilance control device are still to be taken in hand as delivery for these sets has not yet materialised. The extended use of this device is dependent on its satisfactory functioning over long periods.

2. **Para. 59 of the report:** Necessary instructions on the subject have been issued to the Railways vide Board's circular letter *No. 72/W3/SG A/3, dated 14-4-72.

3. **Para. 60 of the report:** Instructions have been reiterated to the Railways to ensure that speedometers/recorders are maintained satisfactorily.

*Not reproduced.

Annexure-II.

RELEVANT RULES

G. R. 265. Manual Stop Signals.—Fixed signals worked manually are called 'Manual Stop Signals' in this chapter. They cannot be passed at "on" except as provided for in the relevant rules in chapter II(E).

G. R. 266. Semi-Automatic Stop Signals.—A semi-Automatic Stop Signal is a fixed signal, having both manual and track-circuit controls. It is capable of being operated either as an Automatic Stop Signal or as a Manual Stop Signal, as required.

When the signal works as Automatic Stop Signal, it assumes "on" and "off" aspects automatically according to the condition of the track-circuit sections ahead. When the signal works as Manual Stop Signal, it assumes "on" aspect automatically on the occupation of the track circuit section ahead, but assumes "off" only when operated manually provided the relevant track-circuit sections ahead are clear.

G. R. 267. Normal aspect of Manual and Semi-Automatic Stop Signals.—The normal aspect of a Manual Stop Signal is "on". The normal aspect of a Semi-Automatic Stop Signal when worked as Automatic is "off", but when it is worked as manual, it is "on".

G. R. 268. Forms of Automatic/Semi-Automatic Stop Signals.—Automatic and Semi-Automatic Stop Signals shall be colour light signals.

G. R. 269. Marker.—(1) An Automatic Stop Signal shall be provided with a marker, consisting of a white enamelled disc with a letter 'A' in black.

(2) A Semi-Automatic Stop Signal shall be provided with a marker, which shall show a white illuminated letter 'A' only when the signal works as an Automatic Stop Signal. The letter 'A' should be distinctly visible, when lit, both by day and night.

G. R. 275. Significance of various aspects of Automatic Stop Signals.—

Where Automatic Signalling is provided, the signals may be of three or four aspects. In three-aspect signalling, the aspects indicated by a Stop signal shall normally be 'Clear' 'Caution', and 'Danger' and in four-aspect signalling, the aspects shall normally be 'Clear', 'Attention', 'Caution' and 'Danger'.

The significance of various aspects of Automatic Stop and Automatic Repeating Signals is as follows:—

A—Automatic Stop Signals

Aspect		Meaning
GREEN (MARKER A)	Clear	Proceed at normal speed permissible; next stop signal is "off"
YELLOW YELLOW (MARKER A)	Attention	Proceed preparing to pass the next stop signal at restricted speed.
YELLOW (MARKER A)	Caution	Proceed preparing to stop at the next stop signal.
RED (MARKER A)	Danger	Stop and observe Rule 276.

NOTE—Chapter II (E) lays down procedure when fixed signals are defective.

S. R. 122/1—While a train is in motion, the Driver and Assistant Driver or Fireman must keep a constant look-out for signals and obstructions, and be prepared for an immediate application of brakes at any moment.

4—1 M of TCA/73

Annexure-II.

Proceedings of the Administrative Enquiry into alleged unsafe failures of Down Main Line Starter Signal No: E 26 at Chengail on 23-10-1969 & 29-12-1969.

BRIEF HISTORY

On 27-11-'70, Down EMU Empty Rake of K 101A, Bauria-Kharagpur Local collided in the rear of 39 Dn. on the Automatic section between Bir Shibpur and Uluberia. The Motorman of the Empty rake of K 101A contended during the Senior Scale Officers' enquiry into the above collision that he had passed Automatic Signal No. 38 between Bir Shibpur and Uluberia displaying yellow aspect though the automatic block section controlled by this signal was occupied by 38 Dn. During the interrogation by the Senior Scale Officers' enquiry, the Driver had stated in reply to question No. 32, that

> "for example Chengail Starter was showing yellow aspect when the block section between Chengail Starter and Bauria Home Signal was occupied. A number of reports were made about this particular defect."

While giving reasons for the findings the Sr. Scale Officers' Enquiry Committee commented that they had gone through the Defective Signal Register maintained in the Control office at Kharagpur, and

> "came across two reports of an automatic signal showing yellow aspect though the track ahead of it was occupied by a train. The first occasion was on 23-10-1969 when the Down Main Starter Signal of Chengail was reported to be showing yellow aspect though the track ahead of it was occupied by a train. This defect was reported by drivers of three successive trains. The second occasion was on 29-12-1969, again at Chengail, when the Down Main Starter Signal was reported to be showing yellow aspect though the track ahead of it was occupied by a train. This was reported by drivers of two consecutive trains."

The Committee further went on to state that they

> "Went into the probable causes of failure of the Down Main Starter Signal of Chengail on the two occasions. On the first occasion when the Signal was subsequently tested by the Signal Maintenance staff it was found to be working properly. The relays and the signal were also checked and no defect could be detected. Therefore, the Signal Maintenance staff could not locate the cause of the failure. On the second occasion, the failure was revealed to have been the result of short-circuiting of relays by the Signal maintainer who had inspected the signal on getting a report that it was defective. This short-circuiting was subsequently rectified by him and there was no further report of this particular signal failing on the unsafe side."

A.C.R.S., South Eastern Circle, Calcutta, on going through the report of the Senior Scale Officers, addressed a letter No. 4076/MAC-21 dated 27-2-'71 to the C.O.P.S., stating that while going through the proceedings,

> "it has come to light that some of the Automatic signals on the Kharagpur—Howrah section are reported to have failed on the unsafe side. Failing of a signal on the unsafe side is a very serious matter and needs to be enquired into in great detail to find-out why and how such a phenomenon has occurred and what precautions and remedial measures are required to be taken.
>
> "According to the committee while failure of 29-12-'69 has been explained to have occurred as a result of short-circuiting of the relays by the signal maintainer who inspected the signals on getting a report of defective signal, the reason for failure of 23-10-'69 has not been established and it appears that the defect subsequently got corrected automatically. It is felt that it would not be advisable to leave this investigation incomplete in such a manner and the signalling department should make detailed investigation to determine the causes of such occurrences and find out ways and means to prevent a recurrence. It would also be of interest to know the circumstances in which the relays were short-circuited by the signal maintainer on 29-12-'69 to cause a signal failure on the unsafe side and what

action has been taken against him for this very serious offence and irregularity on his part."

Accordingly, vide CSTE (Construction)'s letter No. 6/2/Con/KGP/1319 dated 25-3-'71, Divl. Supdt/Kharagpur was requested to hold a Senior Scale Officers' Joint Enquiry by D.S.T.E. (Works)/Kharagpur and one Operating Officer. This Committee examined witnesses during sittings in April '71. However, before the findings could be drawn up an inspection note of Dy. C.R.S., Shri Shyamasunder Lal was received in which under item 6 he stated that

"(i) It has been mentioned in the enquiry Committee proceedings that the Down main starter signal E 26—a semi-automatic signal, at Chengail station had been reported to have displayed 'off' when the automatic block section ahead of it was occupied. The installation concerning this signal was also inspected and tested, as under :—

(a) Track circuits Nos. 11T, 26T, 26T1, 26T2 and 26T3 between the Down main starter E 26 of Chengail and the Down Home signal W 8/9/12 of next station Bauria were tested. The voltages recorded were:—

	Feed	Relay
	volts	volts
26T3	—	3.0
26T2	1.25	1.25
26T1	1.65	1.2*
26T	1.5	1.45
11T	2.5	1.9*

*Fluctuating perhaps due to loose bonds or other connections.

"The train shunt was in order."

(b) The signal was changing to 'on' (Red) when any of the above track circuits was shunted".

"(ii) The above showed that the down starter was working correctly depending on the automatic block controlled by it being clear or occupied."

"It was however understood from the D.S.T.E. then incharge of this installation that enquiries earlier made into the above case of improper indication had revealed that there was failure of track circuits. The maintainer had bridged/excited the controlling relay and had advised the switchman that the down main starter signal should not be taken 'Off' until the train had arrived complete at the next station (Bauria). But this was perhaps not done and the signal was showing 'Off' when the automatic block in advance was occupied—it could be because the controlling relay had been bridged/excited."

"I discussed the matter with the CSTE and CSTE(C) of South Eastern Railway. Such an action on the part of the maintainer is unauthorised. It is understood that on the ACRS's letter to the Railway, an enquiry into this matter has been ordered. This is a very serious matter and investigation should have been made conclusively at the time and the staff at fault severely punished."

In view of these remarks of Dy. C.R.S., it was considered by the Administration that the matter should be enquired into by Dy. Chief Operating Supdt (Coaching) & Dy. Chief Sig. & Telecom. Engineer(C)/GRC.

Description of the Signal :

The Dn. Main Starter No. 26 of Chengail East Cabin, is a 4-aspect semi-automatic signal with illuminated 'A' marker. The next signal on this Automatic section is the Down Home Signal at Bauria, which is a 3-aspect signal with 2 route indicators. The controlling track circuits of the Down Main Starter are 11T, 26T, 26T1, 26T2, 26T3, 26T4 and 8T. 8T is a block overlap track-circuit and cut-section track-circuits 26T1 to 26T4 are fed in cascade commencing from track circuit 8T, and the final track relay of 26T1 is located at location box No. Y2, near Chengail East Cabin. 11T is a signal overlap track-circuit and the relay is located in the location box No. Y3, which is situated between the station and the east cabin. Track Relay 26T1 is located in location box Y2. Track relay of 26T1 will pick up only when the entire section from 26T1 upto 8T is clear of wheels. The track relays 11T and 26T pick-up independently when they are free of obstruction. Track relays of 11T, 26T & 26T1 are repeated into Chengail East Cabin by means of track repeater relays. Signal No. 26 will clear when track relays 11TR, 26TR and 26TR1 are energised, i.e. when track 11T & 26T are free of wheels and when the cascade from 8T to 26T1 is similarly free of wheels. Except when Signal No. 26 is working as automatic signal, this signal has to be cleared separately for the movement of each train.

DISCUSSION.

The statements of the staff which were recorded by DSO/KGP and DSTE(W)/KGP during April '71 into the failures of Chengail Starter have been over by the present Administrative Enquiry.

The basic points for investigation are :—

(i) whether some automatic signals on the Kharagpur-Howrah section are reported to have failed on the unsafe side, and if so which signals,

(ii) why and how such a phenomenon had occurred,

(iii) the action taken,

(iv) what precautions and remedial measures are required to the taken ?

Point No. I—This was examined by the Sr. Scale Officers' Enquiry Committee which enquired into the accident of 38 Dn. at Uluberia. That Committee had gone through the defective signal register maintained at the Control office at Kharagpur, to cover a period of over one year (from December, 1970 backwards) and came across only two reports, both of Down Main Starter Signal of Chengail showing yellow aspect though the track ahead of it was occupied. The first occasion was on 23-10-'69 and the second occasion on 29-12-'69.

Regarding the alleged failure of 23-10-'69, the present committee finds that Driver Sri Gurmukh Singh of train No. 562 Down and Driver Sri B. S. Narayana of Train No. 314 Down had made entries in the defective signal register of Loco/Santragachi (Electric). Supporting entries were found in the Train Control Chart for Howrah—Kharagpur section for 16 to 22 hrs. on 23-10-'69 and vide Bauria Dairy entry No. 335 which read as follows:—

> 'E 562, Driver Gurumukh Singh stopped his train on Down Main against through signals at 18 hrs. and came to station and reported that his train passed Chengail Starter yellow after exchanging signal with Cabinman of Chengail. While proceeding very slowly at a speed of 20 kmph; noticed one brakevan (subsequently came to know Ludlow Pilot) standing at Km. 25/16. He stopped his train with great difficulty and avoided collision.'

Sri S. K. Sengupta, Switchman on duty in the Bauria West Cabin from 18 hrs. of 23-10-'69 to 2 hrs. of 24-10-'69 (witness No. 13) has stated that as far as he remembers, trains U 42, P 40 and U 38 came into the automatic section between Chengail starter No. 26 and Down Home signal of Bauria one after the other, and that the gap between these trains was 20 to 30 ft as noticed by him from the Cabin, when the trains came to a stop.

The Motorman of P 40 on 23-10-69, Sri Mritunjoy (witness No. 15) and Motorman of U 38 on 23-10-69, Sri Rozario (witness No. 6) have both stated that they passed the Chengail Starter at Yellow.

There is however no entry in the station records of Chengail regarding any failure of Signal No. 26 on the date.

Regarding the alleged failure of 29-12-69, the Committee finds that the S&T failure register of Chengail has recorded a failure of the Down Starter commencing from 6.42 hrs.-10.00 hrs. of 29-12-69. This is supported by entry No. 470 of the Station Diary.

The Train Control Chart for this period of 29-12-'69 has also recorded a failure of Chengail Down Starter from 6.42 hrs.

The Station Diary of 29-12-'69 for Bauria has recorded (vide item No. 717) that while Appolo-2 was being admitted into the Down loop, the Driver of 38 Dn. received 2 yellow signals and avoided collision. There is a corresponding report dated 29-12-'69 entered by the Driver of the 38 Dn. in the defective signal register of Loco/Santragachi.

This incident itself is corroborated by the depositions of Sri D. Bhimanna, Driver of 38 Dn. (Witness No. 4), Sri N. R. Rao, Guard of Appolo-2 (Witness No. 8) and Sri K. K. Banerjee, ASM/Mauria (Witness No. 18). Sri Das, Guard of 38 Dn. (Witness No. 16) has testified that 38 Dn. passed Chengail at a speed of 55 kmph approximately, and at that he exchanged signals with the Switchman and ASM at Chengail. From the testimony of Sri Naskar, Switchman of Chengail East Cabin (Witness No. 23) it is seen that Appolo-2 and 38 Dn. passed Chengail without any mention of irregularity. It is therefore, clear that 38 Dn. passed Chengail with the Down Starter No. E26 displaying an 'off' aspect.

The train register of Chengail East Cabin indicates that from 23.44 of 28-12-'69 to 2.47 hrs. of 29-12-'69 and from 6.47 to 9.52 hrs. of 29-12-'69 Down trains were passed on 'A' marker. Simultaneously Sri Mondal, Switchman/Chengail (from 18.00 hrs. of 28-12-'69 to 2.00 hrs. of 29-12-'69) (Witness No. 5) has testified that sometime after he came on duty the Starter Signal No. E26 failed and that two auto maintenance staff came to the cabin and took the key of the relay room and went down and that they worked for about half an hour after which they asked him to test the signal and he found it working alright. This statement supported by the entries in the Train Register leads the Committee to conclude that Starter No. E 26 of Chengail was defective from 23.44 hrs. of 28-12-'69 to 9.52 hrs. of 29-12-'69 and that it displayed 'on' aspect during this period except for a spell from 2.47 to 6.47 of 29-12-'69 during which the signal displayed 'Off' aspect when required for passage of trains.

While thus there is a reasonably clear indication of the irregular behaviour of signal No. E26 on 28/29-12-'69, no similar failure of the signal has been reported or recorded in relevant station documents on 23-10-'69, nor is any positive evidence forthcoming except the testimony of the running staff that the signal displayed an 'Off' aspect when the automatic section controlled by it was occupied. It is possible that a Driver who has passed an automatic signal in the 'On' position without observing GR 277 may allege in self-defence that the signal improperly displayed an 'Off' aspect (as has been done by Sri Ramamurthy, Motorman of Empty rake of K 101A in connection with collision that took place at Uluberia station on 27-11-'70). It is however, unlikely that as many as 3 drivers (i.e. of E. 526, of P 40 and of U 38) within a period of one hour passed Chengail Down starter in the 'On' position without observing GR 277. Therefore the Committee concludes that the signal is likely to have displayed an improper aspect on 23-10-'69.

Point No. II—Why and how such phenomenon occurred:

The Down Main Starter Signal No. E 26 at Chengail is a semi-automatic signal. Failure of this signal on the unsafe side means that this signal displayed an aspect other than 'Red' when the Automatic block section controlled by it was occupied. Such failure could take place :—

(a) either due to technical defect of S&T equipment involved, or

(b) due to human manipulation of the S&T equipment,

  (i) either by outside miscreants; or

  (ii) by Railway staff.

The failure of Chengail Down Starter was promptly checked by BSI/SRC in connection with the incident on 23-10-'69 & by the DSTE (Works)/KGP personally in connection with the incident on 29-12-'69. The equipment was found to be in proper order on both the occasions. Further the equipment was also inspected in detail in March '71 by the Dy. CRS whose investigations "showed that the Down Main Starter was working correctly depending on the automatic block controlled by it being cleared or occupied." Therefore, the possibility of technical defect of S&T equipment can be ruled out and the Committee have to consider the other possibility viz. human interference.

As indicated under the "Description of the signal" Down Starter signal No. E 26 of Chengail will clear when track relays 11TR, 26TR & 26TR1 are separately energised. These track relays are between them distributed in two location boxes. The specific nature of the defect alleged **viz.** that signal No. E 26 displayed 'Off' aspect even though the section ahead was occupied by a train, requires that two location boxes should be opened up by outside miscreants and three track relays interfered with at one and the same time. Since there is no evidence of any location box having been broken open and interfered with either on 23-10-'69 or on 29-12-'69 the possibility of interference by outside miscreants can be ruled out. Similarly the possibility of interference by outside miscreants to the S&T equipment in the Cabin has also to be ruled out since there is no such report on either occasion.

Therefore, by the process of elimination the Committee have to consider the only remaining possibility viz. interference by railway staff.

Shri Mondal, (Witness No. 5) Switchman, Chengail East Cabin who was on duty at Chengail East Cabin from 18.00 hrs. of 28/12 to 2 hrs. of 29-12-'69, has stated that during his duty, Starter Signal No. E 26 of Down Main Line failed and that thereafter two auto-maintenance staff took the key of the relay room and went down and that they worked for about half an hour after which he was asked to test the signal and he found the signal to be working all right. By his own admission Sri Basudeb Chakraborty witness No. 11, Khalasi under BSI/KIG, who was on duty from 18.00 hrs. of 28/12 to 6.00 hrs. of 29-12-'69 at Chengail and the testimony of Sri Misra, BM-I, Witness No. 12, reveals that Sri Basudeb Chakraborty was to attend signal failure from 18.00 hrs. to 6.00 hrs. as per roaster.

The Committee therefore have to conclude that on 29-12-'69 the Chengail Down Starter signal No. E 26 improperly displayed an 'Off' aspect when the automatic section controlled by it was occupied as a result of interference of S&T equipment in the relay room by Sri Basudeb Chakraborty. The Committee note that informal enquiries carried out by the Safety Counsellor (Optg) Sri Bhattacharjee, Witness No. 2, along with the Safety Counsellor (Mech), Sri Sujan Singh, in January '70 indicated such interference by S&T staff. Sri Bhattacharjee had submitted a report to this effect on 9-1-1970.

As regards the incident of 23-10-'69 the Committee note that Sri Basudeb Chakraborty was on duty on that day also.

The Committee find from the records that no D&A proceedings have so far been instituted against Sri Basudeb Chakraborty.

Point No. III—The action taken:

The D.S.T.E., the in-charge of maintenance, the BSI/Auto/SRC and ABSI/Auto/SRC have been examined by the Committee and it is on record that they promptly carried out the technical tests of the equipment controlling the working of Chengail Down Starter on both the occasions. As regards investigations into the possible cause of failure when neither the equipment had been found to be defective nor there was evidence of miscreant activity, the Committee find that even on receipt of report on 9-1-'70 from Safety Counsellor (Optg) no formal enquiry was ordered though such an enquiry was suggested by the D.S.T.E. in-charge in connection with the incident of 23-10-'69. The conclusions recorded by the Senior Scale Officer's enquiry Committee who drew up the findings of the Uluberia accident of 38 Dn. regarding the as then alleged failure of the Chengail Down Starter signal on 23-10-'69 and 29-12-'69 were misplaced because these conclusions were not backed by any specific investigations into these incidents. On the report of the Safety Counsellor dated 9-1-'70 there is an endorsement dated 11-1-'70 from the DSO that the report had been relayed to the DSTE on telephone. The DSTE however, denies any knowledge of this report till the date of Uluberia enquiry i.e. December 1970. In December 70 when the DSTE in charge admits to have been the report of the Safety Counsellor bringing out serious allegations against his staff he did not initiate any action because he felt that the safety Counsellor had initially failed to support his report by recorded statements and he felt that after a lapse of one year the staff were bound to deny any knowledge. However, while drawing up the Report of the fact finding enquiry the DSTE relied entirely on this unsupported report of the Safety Counsellor.

FINDINGS.

We, the undersigned having carefully considered **all the evidences do find that**:-

(i) Down Main Starter signal No. E 26 of Chengail did on 29-10-'69 indicate an 'Off'. aspect when the automatic block section controlled by it was occupied; and on 23-10-'69 is likely to have similarly displayed an improper aspect.

(ii) Sri Basudeb Chakraborty/Khalasi of S&T Dept(C) is prima facie held responsible for interfering with the S&T equipment in the Relay room at Chengail East Cabin.

(iii) In the absence of any technical defects in the S&T equipment and of evidence of miscreant interference, the possibility of interference to equipment by S&T staff should have been investigated.

(iv) Grounds existed in the form of Safety Counsellors report dated 9-1-'70 to consider that, prima facie, Shri Basudeb Chakraborty had on 29-12-'69 interfered with S&T equipment controlling the working of Chengail Down Main Starter No. E 26; these grounds should have caused initiation of D&A proceeding against him.

Sd/Member 20-12-'71

(A. Viswanathan)

Dy. C.S.T.E. (Con)/GRC

d/President 20-12-'71

(K. K. Arora)

Optg. Supdt(C)/GRS.

Call No.................... Acc. No......................
CENTRAL SECRETARIAT LIBRARY
केन्द्रीय सचिवालय ग्रन्थागार

RECOMMENDATIONS.

1. S&T Staff below the rank of Block Maintainer should not have an independent access to the relay room.
2. Every case of suspected failure of a signal on the unsafe side should invariably be formally enquired into at the appropriate gazetted level.
3. In the absence of any technical defects in the S&T equipment and any miscreant activity, the obvious possibility of interference of S&T equipment should be promptly investigated.

Sd/

Member 20-12-'71.
A.Viswanathan/Dy. C.S.T.E.(Con)/GRC.

Sd/

President 20-12-'71
(K. K. Arora)
Dy. C.O.P.S. (Coaching)/GRC.

MGIPCBE—S4—1 M of TCA/ND/73—14-11-73—510.